CHAPTER 13
SETUP
LESSON PLAN 13

METHOD:

Conference, demonstration, and practical exercise

TIME ALLOTTED:

3.0 hours

COURSE PRESENTED TO:

a. Unit NCOs
b. Instructors
c. TSC personnel

TOOLS, EQUIPMENT, AND MATERIALS:

See Appendix A

PERSONNEL:

a. Primary instructor
b. Assistant instructor

INSTRUCTIONAL AIDS:

a. TDRS computer unit
b. Overhead projector
c. Viewgraphs (Appendix E)

REFERENCES:

TM 9-6920-711-12&P-1

APPENDICES:

Appendix A. Tools, Equipment, and Materials
Appendix B. Safety
Appendix C. Test Administrative Guide
Appendix D. Practical Exercise
Appendix E. Viewgraphs

13-1. INTRODUCTION. (5 minutes)

Note. Show Slide 1.

a. **Reason.** To prepare different types of gunnery and force-on-force exercises, you must know how to operate the TDRS setup program.

Note. Show Slide 2.

b. **Training Objective.** In a classroom environment, given a TDRS computer unit and TM 9-6920-711-12&P-1, you will perform the following:

(1) Operate setup program controls and indicators.
(2) Set up a panel gunnery exercise.
(3) Set up a force-on-force exercise.
(4) Set up a scaled gunnery exercise.
(5) Set up a tracking training exercise.

c. **Procedures.** During this block of instruction, we will cover the controls, indicators, and features of the TDRS setup program provided with the TDRS computer unit. You will have an assistant instructor for the practical exercise portion of this class.

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE. (170 minutes)

Notes. 1. The students must have the setup program started.
2. The primary instructor discusses setup screen controls and indicators.
3. The primary instructor will release the students to their assigned assistant (small group) instructors for the practical exercise portion of this lesson.
4. Show Slide 3.

a. **Set Up Program Menu**. The setup menu contains all controls and indicators required to program training exercises for TWGSS/PGS. The setup menu is divided into 11 input areas. These are:

Note. Show each input area to the students.

(1) Card Control
(2) Application
(3) Validity
(4) Organization
(5) Main weapon
(6) Coax weapon
(7) Missile weapon
(8) Exercise type
(9) Tracer

(10) Presentation
(11) Firing

Notes. 1. Discuss each input area briefly.
2. Show Slide 4.

b. **Card Control**. This function group contains controls relating to communication with the TDRS memory card. These buttons are used to save data onto a TDRS memory card or read data from the TDRS memory card.

(1) **New setup.** This button allows pre-programmed data of the selected application to be loaded into memory and presented in the input field of the setup program. The values and data previously input will be overwritten.

Note. Read/Modify cannot read how many rounds remain after an exercise. It can read the TDRS memory card only as initially programmed.

(2) **Read/Modify.** When the TDRS memory card is inserted into the TDRS computer unit, this button allows the data from the TDRS memory card to be read and presented in the input fields of the setup program.

Note. If the application programmed on the TDRS memory card was incorrect or not stored in the TDRS computer unit, an error will occur.

(3) **Prog card.** This button saves the current set up data onto the TDRS memory card.

Note. Detailed function of this button will be explained later in the course.

(4) **EXCEL® log.** This button allows the program to read data from the TDRS memory card and save the data on a 3.5 in. disk. The file is stored as a text file (extension .TXT) readable by the EXCEL® program.

Note. Show Slide 5.

c. **Application.** This input field (item 5) displays the application selected or read from the TDRS memory card. Click on the drop down list box (item 6) in the application library and available applications are displayed. Applications for PGS and TWGSS are available.

(1) **Configuration number.** Each application programmed in the TDRS computer unit has a configuration number. This number (item 8) cannot be changed or modified. It is used to verify that the most recent application is being used.

(2) **Application picture.** A picture (item 7) of the selected application is presented in this box.

Notes. 1. Each application contains the data presented in the input field and the weapon/vehicle specific data required for the simulator.
2. As new applications are developed, the application library is updated.
3. Show Slide 6.

(3) **M2 and M3.** These applications (item 9) are used by PGS. There are several applications for each of the BFV variants.

(4) **M1, M1IP, M1A1, and M1A2.** These applications (item 10) are used by TWGSS. There is one application for each of the Abrams tank variants.

Note. 1. TWGSS/PGS do not require a range to be used for training. If a training area is selected, this allows an AAR with vehicles presented on a map. The use of this feature is not required to train with TWGSS.
2. Show Slide 7.

(5) **Training area.** The information (item 12) indicates the location where the exercise will take place. Click on the drop down list box (item 11) and other locations available for TWGSS/PGS exercises are presented.

Note. Show Slide 8.

(6) **Time selection.** Each training area location available for TWGSS/PGS training is listed in the drop down menu. Each location has standard clock time (SCT) (item 14) and day light savings time (DST) (item 13) listed. Appropriate time must be selected prior to training exercise.

Note. Show Slide 9.

d. **Validity.** This section controls downloading of data from the TDRS memory card to TWGSS/PGS. The criteria for downloading data from the TDRS memory card is selected from this input field.

(1) **Card total reload.** This checkbox (item 15) is always checked and allows reload of all data from the TDRS memory card at system power up.
(2) **First insert only.** Certain application data will be downloaded at system power up only once if this checkbox (item 16) is selected. This allows for a shorter startup procedure at system power up.

Note. If new ammo is not selected, the ammunition in the system will remain the same as when the system was powered down.

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE (Con't).

(3) **New ammo.** When this checkbox (item 17) is selected, the vehicle ammunition is reloaded with the programmed ammunition load at each download of the TDRS memory card.

(4) **First insert only.** When this checkbox (item 18) is selected, ammunition will be downloaded into the system only upon first system power up. If checkbox is not selected, new ammunition will be downloaded each time power is applied to TWGSS/ PGS.

Note. Show Slide 10.

e. **Organization.** This input field describes who will use the TDRS memory card (i.e., the vehicle/system where the TDRS memory card will be installed).

(1) **Text input areas.** There are four fields available for programming user information (item 19). Prior to training exercise, the instructor will input this information which will be stored in the computer file containing the exercise results from that particular vehicle/system.

(2) **ID.** Each system participating in a training exercise can be given an unique identity number (item 21). There are 1024 identities available for each application of PGS and TWGSS. This identity is sent as an encoded laser message by the transceiver unit to the vehicle under attack. The identity will be stored on the TDRS memory card of the vehicle being fired upon. If the checkbox ID auto inc. is NOT selected, then the instructor must provide each TDRS memory card with an identity number prior to programming the TDRS memory card.

(3) **ID auto inc.** If the ID auto inc. checkbox (item 21) is selected, each time the instructor saves the ID it will automatically be increased by one during the set up of the next TDRS memory card. This ensures that two TDRS memory cards will not receive the same ID number during the training exercise.

Note. Show Slide 11.

(4) **Changing organization text names.** The names for each text box can be changed using Setup in the toolbar and selecting Select Organization Text Names option in the submenu. The instructor can change the text box labels to fit the requirements of the unit or training exercise to be performed.

Note. Show Slide 12.

f. **Main weapon.** This input function describes the quantity of main weapon ammunition available at the start of the training exercise. Ammunition can be stored as ready ammunition in the turret or stowed ammunition in the hull.

Notes. 1. Main weapon ammunition presented is application specific.
2. The number of rounds stored in the hull cannot exceed the capacity of the vehicle.
3. For M1 tank applications, the hull ammunition presented includes both semi-ready rack and hull rounds.

(1) **Main weapon ammunition-hull.** This text box (item 23) sets the number of main weapon rounds stored in the hull at the start of the training exercise.

Note. The number of rounds stored in the turret cannot exceed the capacity of the vehicle.

(2) **Main weapon ammunition-turret.** This text box (item 22) sets the number of main gun rounds loaded in the turret at the start of the training exercise.

Note. All loadtimes are presented in seconds.

(3) **Loadtime-turret.** A loadtime (item 25) must be programmed for vehicles that require the main weapon to be loaded manually. This time can be adjusted to reflect actual crew experience and skills.

Notes. 1. All loadtimes are presented in seconds.
2. Maximum loadtime is 600 seconds (10 minutes).

(4) **Loadtime-hull.** Hull loadtime (item 24) describes the time it takes to transfer hull ammunition into the turret. This time can be adjusted to reflect actual crew experience and skills. Ammunition upload can be started by the commander from the control panel menu SIMULATION, REMAINING AMMO.

Note. Show Slide 13.

g. **Coax weapon.** This input function describes the quantity of coax weapon ammunition available at the start of the training exercise. Ammunition can be stored as ready ammunition in the turret or stowed ammunition in the hull.

(1) **Coax ammunition-hull.** This text box (item 27) sets the number of coax rounds loaded in the hull at the start of the training exercise.
(2) **Coax ammunition-turret.** This text box (item 26) sets the number of coax rounds loaded in the turret at the start of the training exercise.

Notes. 1. The number of rounds stored in the turret or hull cannot exceed the capacity of the vehicle.
2. All loadtimes are presented in seconds.
3. This text box is normally set to 0 seconds.

(3) **Loadtime-turret.** A loadtime (item 29) can be programmed for vehicles with manual loading of the coax gun. This time can be adjusted to reflect actual crew experience and skills.

Notes. 1. All loadtimes are presented in seconds.
2. Maximum loadtime selectable is 600 seconds (10 minutes).

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE (Con't).

(4) **Loadtime-hull.** Hull loadtime (item 28) describes the time it takes to transfer hull ammunition into the turret. This time can be adjusted to reflect actual crew experience and skills. Ammunition upload can be started by the commander from the control panel menu SIMULATION, REMAINING AMMO.

Note. Show Slide 14.

h. **Missile weapon.** This input function describes the quantity of missile weapon ammunition available at the start of the training exercise. Ammunition can be stored as ready ammunition in the turret or stowed ammunition in the hull.

(1) **Missile ammunition-hull.** This text box (item 31) sets the number of missiles loaded in the hull at the start of the training exercise.
(2) **Missile ammunition-turret.** This text box (item 30) sets the number of missiles loaded in the turret at the start of the training exercise.

Notes. 1. Only one missile can be loaded at one time into each tube.
2. This text box is normally set to 0 seconds and cannot be changed.

(3) **Loadtime-turret.** This text box (item 33) sets the time it will take to load a missile from the turret into the weapon.

Notes. 1. All loadtimes are presented in seconds.
2. Maximum loadtime is 120 seconds (2 minutes).

(4) **Loadtime-hull.** This text box (item 32) presents the time it takes to load a missile from the hull into the turret (or launcher). Ammunition upload can be started by the commander from the control panel menu SIMULATION, REMAINING AMMO.

Note. Show Slide 15.

i. **Exercise type.** The system can perform two types of exercises which are selected through the option button in the Exercise type area.

Note. The retro reflector must be positioned in the center of mass of the target panel during panel gunnery. The crew will use this point as their aim point and the control panel result will be in relation to this point.

(1) **Panel gunnery.** This training mode (item 34) is designed for firing on stationary or moving panel targets equipped with retro reflector units installed on the center of mass of the target panel.

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE (Con't).

Note. The retro reflectors must be positioned on the turret of the target vehicles during combat mode training. The crew will use center of mass of the vehicle as their aim point and the control panel result will be in relation to the center of mass of the vehicle.

(2) **Combat mode.** Combat mode (item 35) is designed for force-on-force exercises or firing on vehicles with retro reflector units installed on top of the turret.

Note. Show Slide 16.

j. **Tracer.** The instructor can select the visual effect the gunner/commander will experience during the training exercise.

Note. Tracer effects must be switched OFF during tracking training exercises.

(1) **Tracer on.** The tracer of the round can be switched off or set to normal effect. Click on Tracer on checkbox (item 36) for normal effect.

Note. Burst effects must be switched OFF during tracking training exercises.

(2) **Burst on.** The burst on target and ground burst function can be switched on or off. Click on Burst on checkbox (item 38) for normal effect.

Note. Obscuration effects must be switched OFF during tracking training exercises.

(3) **Obscuration.** Obscuration may be switched OFF by setting obscuration time to 0 seconds in the textbox (item 37). To set obscuration ON, set the obscuration to a minimum of 1 second. Obscuration duration can be adjusted to a maximum of 5 seconds in increments of one second.

Note. Show Slide 17.

k. **Presentation.** The instructor can select if the crew will be able to hear the audio indications in the intercom and see the result of an engagement on the control panel.

Notes. 1. The target sound indications Kill and Hit, and all firing sound indications are NOT switched off.
2. Sound effects must be switched OFF during tracking training.

(1) **Audio.** If the audio checkbox (item 39) is checked, the crew will hear NEAR MISS sound indications in the intercom system. If checkbox is NOT checked, NEAR MISS audio indications will not be heard. All other indications will remain.

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE (Con't).

Note. Numerical and graphical presentation of fire results are inhibited.

(2) **Fire result on CP.** The instructor can choose control panel result presentation. If the Fire result on CP checkbox (item 40) is checked, the engagement result will be presented to the crew. If the checkbox is not checked, the result will not be presented and the crew will have to rely on their visual indications for decision making.

Note. Show Slide 18.

l. **Firing.** The type of training exercise the crew will perform is selected here. There are three types of training exercises available.

(1) **Full scale (item 41).** This mode is used for exercises with targets in 1:1 scale. The weapon effect simulations are the same as during normal firing.

Note. If the Setup pushbutton is pressed, the selected scale can be viewed but not changed.

(2) **Scaled gunnery (item 42).** Scaled gunnery is performed against scaled targets. For TWGSS, a 1:2 (one half) scale is used. For PGS, a 1:10 (one/tenth) scale is used. The target size and distance must be adjusted to match the training mode. Minimum distance between a firing system and a target is 60 m.

(3) **Tracking (item 43).** Tracking training allows the crew to practice target tracking using vehicle controls to track targets. If tracking training is selected, the following selections must also be made:

Notes. 1. Ensure tracer, burst, obscuration and sound is switched OFF during tracking training.
2. For missile weapons, tracking time equals the time of flight to the target.
3. Show Slide 19.

(a) Tracking time (non-missile weapons). Tracking time is the amount of time the system will track a target before tracking is inhibited. A time window of 3 - 120 seconds is available. Tracking starts when the palm switch is activated and stops when the weapon trigger is pulled.

(b) Target tracking (missile weapons). Tracking training for missile weapons evaluates how the gunner aimed on the target in relation to center of mass during the actual flight of the missile. Tracking data collection starts when the trigger is pulled and continues until the missile hits the target.

Note. Show Slide 20.

13-2. CONFERENCE/DEMONSTRATION/PRACTICAL EXERCISE (Con't).

(c) Figure of merit parameters. The instructor must determine the standard with which to evaluate the crew. A value of 0-5 mils with a resolution of 0.1 mil can be selected. The value selected is the radius of a circle placed around the ideal aim point on the target. The result of target tracking is presented as the time the gunner aimed within the circle in relation to total tracking time (result presented as %).

Note. Show Slide 21.

(4) **Ammunition dispersion.** Ammunition dispersion may be selected by clicking on the checkbox.

Notes. 1. When multiple ammunition rounds are fired, a random dispersion factor will be added as follows:

(a) Coax: 1 mil will be added.
(b) 25 mm: 0.5 mil will be added.
(c) 105/120 mm: 0.3 mil will be added.
(d) TOW: no dispersion will be added.

2. The primary instructor will release the student crews to their assigned assistant (small group) instructors for the practical exercise portion of this lesson.
3. Prior to students' arrival, ensure that an assistant instructor is assigned to each training station and that training station is properly prepared.
4. Direct students to their appropriate training station.
5. Each assistant instructor is to conduct a safety briefing for his small group IAW Appendix B.
6. Whenever possible, have the students serve as demonstrators during small group instruction. Have one student read the procedures while another student performs the task. To ensure all students get equal hands-on time, rotate the reading and performance responsibilities.
7. The assistant instructor discusses and clarifies the procedures as required and reinforces the training objective.
8. Using Appendix D, practice TDRS memory card setups.
9. Verify TDRS memory card set up using vehicle stations.

13-3. TEST. (20 minutes)

See Appendix C.

13-4. FINAL REVIEW. (5 minutes)

a. **Student Questions.**

Note. Show Slide 22.

13-4. FINAL REVIEW (Con't).

b. **Summary of Main Teaching Points.**

(1) Setup program controls and indicators
(2) Panel gunnery exercise setup
(3) Force-on-force exercise setup
(4) Scaled gunnery exercise setup
(5) Tracking training exercise setup

Note. Show Slide 23.

c. **Closing Statement.** This block of instruction has taught you how to properly prepare TDRS memory cards for the different types of training exercises.

APPENDIX A
TO LESSON PLAN 13

SETUP

TOOLS, EQUIPMENT, AND MATERIALS

A-1. CLASSROOM STATION.

Listed equipment is one per student, except as noted.

1. TDRS computer unit (one per two students)
2. TDRS memory card
3. TM 9-6920-711-12&P-1

A-2. VEHICLE STATION.

Listed equipment is one per four students, except as noted.

1. M1A2 tank with TWGSS installed and aligned and eye-safe laser filter (ELF) installed
2. Boresight panel with retro reflector unit (one per class)
3. Training area with a minimum of 1200 m of maneuver space

APPENDIX B
TO LESSON PLAN 13

SETUP

SAFETY

Listed general safety regulations are to be strictly enforced during the performance of this lesson.

1. Mount and dismount tank over left front fender.
2. Maintain three points of contact while on top of tank.
3. No smoking within 50 m of tank.
4. Do not go over or under the gun tube.
5. Ensure LRF has eye-safe laser filter (ELF) installed and LRF is set to SAFE.
6. LASER SAFETY: Do not view transceiver unit with optics from a distance of 25 m or closer.
7. Ensure proper hearing protection is worn when using pyrotechnics.
8. When using pyrotechnics (Hoffman device), ensure area is clear 50 m to the front and 25 m to the sides.
9. Ensure gun/turret drive (GTD) switch is set to MANUAL position during installation/removal, alignment, troubleshooting, and before leaving turret.
10. Ensure vehicle master power switch is in OFF position before connecting or disconnecting TWGSS cables.
11. No cables should be connected or disconnected by untrained personnel.
12. Extra care should be taken when power is switched on after TWGSS installation. This is to ensure integration to FCS is correct and secure.

APPENDIX C
TO LESSON PLAN 13

SETUP

TEST ADMINISTRATIVE GUIDE

C-1. TASK.

Administer test, *Setup*. .

C-2. CONDITIONS.

Given a TDRS computer unit, TDRS memory card, and TM 9-6920-711-12&P-1.

C-3. STANDARDS.

The student will correctly answer 8 out of 10 questions within 15 minutes.

C-4. PERSONNEL, EQUIPMENT, AND MATERIAL REQUIRED.

a. Evaluator
b. TDRS computer unit (one per student)
c. TDRS memory card (one per student)
d. TM 9-6920-711-12&P-1 (one per student)
e. Written test of Appendix C (one copy for each student tested)

C-5. TEST PLANNING TIME.

Administrative time:	5 minutes
Test time:	15 minutes
TOTAL TIME (per student):	20 minutes

C-6. OTHER INFORMATION.

Before the student arrives, the evaluator will:

a. Ensure that each computer is operational and switched OFF.
b. Ensure that each bench has one TDRS computer unit, TDRS memory card, and TM 9-6920-711-12&P-1.
c. Have written test ready for student to be tested.

C-7. INSTRUCTIONS TO STUDENT.

“The purpose of this test is to evaluate your understanding of the TDRS computer unit setup. You will have 15 minutes to complete the test. Your time will start when I announce ‘BEGIN’ and end when you announce ‘FINISHED’. You may use the materials in front of you during the test".

“Do you understand the requirements of this test?” (Answer questions)
“You may begin.” (Start time)

SETUP

Written Test

NAME_____UNIT_____

GRADE_____ DUTY POSITION_____

1. What scale is used for PGS scaled training mode? _____
2. What scale is used for TWGSS scaled training mode? _____
3. What is the maximum number of rounds that can be loaded into the hull of an M1 tank for TWGSS simulation? _____
4. What is the maximum number of 25 mm rounds that can be loaded into the hull of an M2 BFV for PGS simulation? _____
5. What is the minimum and maximum allowable tracking time during tracking training? _____
6. What is the minimum and maximum allowable figure of merit intervals during tracking training? _____
7. What does the abbreviation DST stand for? _____
8. Explain the abbreviation SCT? _____
9. Which disk drive on <u>your</u> computer is used for the TDRS memory card? _____
10. What is switched ON in the AAR main window with the AUDIO checkbox? _____

SETUP

Test

Question	Correct answer
1	1/10 scale
2	½ scale
3	30 rounds
4	600 rounds
5	3-120 seconds
6	0-5.0 mils
7	Daylight Savings Time
8	Standard Clock Time. Normal time used during the year except during summer where daylight savings time is used
9	Check with computer prior to test
10	NEAR MISS Audio Indications in Intercom

APPENDIX D
TO LESSON PLAN 13

SETUP

PRACTICAL EXERCISES

D-1. PRACTICAL EXERCISE.

You will act as the tank crew evaluator (TCE) for B32, an M1A2 crew from 1st Bn 112th Armor 49AD. The tank commander is SSG Jones and the Gunner is SGT Smith. The loader on B32 has an average loading time of 5 seconds. The range is dry and the average obscuration time is about 6 seconds. The gunnery table being trained is TT VIIA. The tank crew will be issued the normal ammunition load for a TT VIIA exercise consisting of:

SABOT:	10 rounds
HEAT:	2 rounds
Coax:	50 rounds

Due to limited training areas, TT VIIA is being fired on a half scale range. During the AAR, use only gunnery results such as ammunition, time, impact point, and all vehicle related events.

D-2. SETUP FOR PANEL GUNNERY.

Application:	M1A2
Exercise Area:	Select exercise area used
New Ammo:	Yes
First Insert Only:	No
Main Weapon:	
SABOT Turret:	11 rounds
HEAT Turret:	6 rounds
SABOT Hull:	15 rounds
HEAT Hull:	8 rounds
Load Time:	7 seconds
Upload Time:	60 seconds
COAX Weapon:	
7.62 Turret:	400 rounds
7.62 Hull:	0 rounds
Upload Time:	- seconds
Exercise Type:	Panel gunnery
Tracer:	
Tracer On:	Yes
Burst On:	Yes
Obscuration:	1 second
Presentation:	
Audio:	Yes
Control Panel Presentation:	Yes
Firing:	Full scale
Dispersion:	No
User Data:	B 34 2-66 AR ID 17 TC SFC: Smith Gunner: SGT Jones
Event:	TT IV

D-3. SETUP FOR COMBAT MODE (FORCE-ON-FORCE).

Application:	M1A2
Exercise Area:	Select exercise area used
New Ammo:	Yes
First Insert Only:	Yes
Main Weapon:	
SABOT Turret:	8 rounds
HEAT Turret:	4 rounds
SABOT Hull:	10 rounds
HEAT Hull:	6 rounds
Load Time:	5 seconds
Upload Time:	300 seconds
COAX Weapon:	
7.62 Turret:	400 rounds
7.62 Hull:	0 rounds
Upload Time:	- seconds
Exercise Type:	Combat mode
Tracer:	
Tracer On:	Yes
Burst On:	Yes
Obscuration:	1 second
Presentation:	
Audio:	Yes
Control Panel Presentation:	No
Firing:	Full scale
Dispersion:	No
User Data:	B 34 2-66 AR ID 17 TC SFC: Smith Gunner: SGT Jones
Event:	Force-on-force

D-4. SETUP FOR TRACKING TRAINING.

Application:	M1A2
Exercise Area:	Select exercise area used
New Ammo:	Yes
First Insert Only:	Yes
Main Weapon:	
SABOT Turret:	11 rounds
HEAT Turret:	6 rounds
SABOT Hull:	15 rounds
HEAT Hull:	8 rounds
Load Time:	7 seconds
Upload Time:	60 seconds
COAX Weapon:	
7.62 Turret:	400 rounds
7.62 Hull:	0 rounds
Upload Time:	0 seconds
Exercise Type:	Panel gunnery
Tracer:	
Tracer On:	No
Burst On:	No
Obscuration:	0 seconds
Presentation:	
Audio:	No
Control Panel Presentation:	No
Firing:	Tracking
Tracking Time:	10 seconds/1.0 mil
Dispersion:	No
Organizational Data:	B 34 2-66 AR ID 17 TC SFC: Smith Gunner: SGT Jones
Event:	Tracking training

APPENDIX E
TO LESSON PLAN 13

SETUP

VIEWGRAPHS